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ABSTRACT

This flight test guide assists the applicant and his instructor in preparing for the Private or Commercial Pilot Rotocraft Certificate with Helicopter Rating under Part 61 (revised) of Federal Aviation Regulations. It contains information and guidance concerning the pilot operations, procedures, and maneuvers relevant to the flight test required for those certificates. Preflight operations, airport and traffic pattern operations, straight and level flight, climbs, descents and turns, normal and crosswind takeoffs and landings (commercial), hovering, maneuvering by ground references and air taxiing, rapid descent with power and recovery (commercial), high altitude takeoffs, roll-on landings and rapid decelerations, cross-country flight operations, and emergency operations are outlined. A suggested flight test checklist is included. (KP)

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AC 61-59

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FLIGHT TEST GUIDE

(Part 61 Revised)

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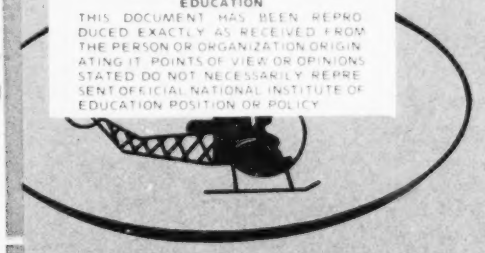

PRIVATE and COMMERCIAL PILOT

Helicopter

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AC 61-59

FLIGHT TEST GUIDE

[Part 61 Revised]

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PREFACE

Part 61 (revised) of Federal Aviation Regulations, effective 1 November 1973, establishes a new concept of pilot training and certification requirements. To provide a transition to these revised requirements, Part 61 (revised) permits the applicant, for a period of 1 year after the effective date, to meet either the previous requirements or those contained in the revised part. AC 61–25, *Private and Commercial Pilot Helicopter Flight Test Guide*, dated 1962, outlines the previous requirements.

This flight test guide, AC 61–59, has been prepared by Flight Standards Service of the Federal Aviation Administration to assist the applicant and his instructor in preparing for the flight test for the Private or Commercial Pilot Rotorcraft Certificate with Helicopter Rating under Part 61 (revised). It contains information and guidance concerning the pilot operations, procedures, and maneuvers relevant to the flight test required for those certificates. A suggested flight test checklist is included for the convenience of those who may find such a checklist useful.

In addition to providing help to the applicant and his instructor, this guide will be

useful to FAA Inspectors and designated pilot examiners in the conduct and standardization of flight tests. Persons using this guide in connection with pilot training and flight tests should also refer to the applicable *Federal Aviation Regulations; Airman's Information Manual;* AC 61–21, *Flight Training Handbook;* AC 61–13A, *Basic Helicopter Handbook;* and other pertinent advisory circulars.

Comments regarding this guide may be directed to Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

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APPLICANT'S FLIGHT TEST CHECKLIST

(Suggested)

APPOINTMENT WITH INSPECTOR

OR EXAMINER: Name _____

Time/Date _____

ACCEPTABLE HELICOPTER

- ☐ Aircraft Documents:
  - Airworthiness Certificate
  - Registration Certificate
  - Operating Limitations
- ☐ Aircraft Maintenance Records:
  - Airworthiness Inspections
- ☐ FCC Station License

PERSONAL EQUIPMENT

- ☐ Current Aeronautical Charts
- ☐ Computer and Plotter
- ☐ Flight Plan Form
- ☐ Flight Logs
- ☐ Current AIM

PERSONAL RECORDS

- ☐ Pilot Certificate
- ☐ Medical Certificate
- ☐ Signed Recommendation
- ☐ Written Test Results
- ☐ Logbook
- ☐ Notice of Disapproval (if applicable)
- ☐ Approved School Graduation Certificate (if applicable)
- ☐ FCC Radiotelephone Operator Permit
- ☐ Examiner's Fee (if applicable)

GENERAL INFORMATION

PILOT TRAINING AND CERTIFICATION CONCEPT

Part 61 of the Federal Aviation Regulations has been revised and upgraded to reflect the complexity of the modern aircraft as well as its operating environment. In the past, airman certification requirements could be met by training a student to pass a written test and the to demonstrate his ability to perform predetermined flight training maneuvers during a flight test. Rather than merely duplicating on the flight test the maneuvers used for training, the new training and certification concept requires that the applicant receive instruction in and demonstrate his competency in *all pilot operations* listed in pertinent sections of Part 61 (revised). A pilot operation, as used herein, is a group of related procedures and maneuvers involving skills and knowledge required to safely and efficiently function as a pilot. The specific procedures and maneuvers used to teach the pilot operations are not listed in Part 61 (revised). Instead, the instructor is permitted to select procedures and maneuvers from FAA approved training publications pertinent to the certificate or rating

sought. The instructor indicates by logbook endorsement that the applicant has demonstrated competency in all the required pilot operations and considers him qualified to pass the flight test. On the flight test, the examiner[1] selects the procedures and maneuvers to be performed by the applicant to show competency in each required pilot operation.

The procedures and maneuvers appropriate to the Private and Commercial Pilot Rotorcraft Certificate with a Helicopter Rating are contained in either AC 61–21, *Flight Training Handbook,* or AC 61–13A, *Basic Helicopter Handbook;* or are generally accepted by helicopter operators and explained in this flight test guide.

USE OF THIS GUIDE

The pilot operations in this flight test guide, indicated by Roman numerals, are required by Part 61 (revised)—§ 61.107 for the private pilot, § 61.127 for the commercial pilot. This guide is intended only to outline appropriate pilot operations and the minimum standards for the performance of each procedure or maneuver which will be accepted by the examiner as evidence of the pilot's competency. It is not intended that the ap-

[1] The word "examiner" is used hereafter in this guide to denote either the Federal Aviation Administration Inspector or designated pilot examiner who conducts an official flight test.

plicant be tested on every procedure or maneuver within each pilot operation, but only those considered necessary by the examiner to determine competency in each pilot operation. Certain procedures and maneuvers, pertinent *only* to the commercial applicant, are so indicated. Procedures and maneuvers not so indicated apply to both applicants.

When, in the judgment of the examiner, certain demonstrations are impractical, competency may be determined by oral testing. Throughout the flight test several procedures/maneuvers may be evaluated concurrently, i.e., traffic patterns, straight-and-level flight, climbs, descents, and turns.

This guide contains an **Objective** for each required pilot operation. Under each pilot operation, pertinent procedures or maneuvers are listed with ***Descriptions*** and ***Acceptable Performance Guidelines.***

1. The **Objective** states briefly the purpose of each pilot operation required on the flight test.

2. The ***Description*** provides information on what may be asked of the applicant regarding the selected procedure or maneuver. The procedures or maneuvers listed have been found most effective in demonstrating the objective of that particular pilot operation.

3. The ***Acceptable Performance Guidelines*** include the factors which will be taken into account by the examiner in deciding whether the applicant has met the objective of the pilot operation. The airspeed, altitude, and heading tolerances given represent the minimum performance expected in good flying conditions. However, consistently exceeding these tolerances before corrective action is initiated is indicative of an unsatisfactory performance. Any procedure or action, or the lack thereof, which requires the intervention of the examiner to maintain safe flight will be disqualifying. Failure to exercise proper vigilance or to take positive action to ensure that the flight area has been adequately cleared for conflicting traffic will also be disqualifying.

Emphasis will be placed on procedures, knowledge, and maneuvers which are most critical to a safe performance as a helicopter pilot. Unnecessary or avoidable flight into the caution/restricted areas of the "height-velocity curves" as a result of careless operation shall be considered disqualifying. During all maneuvers, the applicant's ability to maintain proper RPM will be carefully evaluated. Areas of particular importance include spatial disorientation, collision avoidance, and wake turbulence hazards.

GENERAL PROCEDURES FOR FLIGHT TESTS

The ability of an applicant for a private or commercial pilot certificate, or for an aircraft or instrument rating on that certificate, to perform the required pilot operations is based on the following:

1. Executing procedures and maneuvers within the aircraft's performance capabilities and limitations, including use of the aircraft's systems.
2. Executing emergency procedures and maneuvers appropriate to the aircraft.
3. Piloting the aircraft with smoothness and accuracy.
4. Exercising judgment.
5. Applying his aeronautical knowledge.
6. Showing that he is the master of the aircraft, with the successful outcome of a procedure or maneuver never seriously in doubt.

If the applicant fails any of the required pilot operations he fails the flight test. The examiner or the applicant may discontinue the test at any time when the failure of a required pilot operation makes the applicant ineligible for the certificate or rating sought. If the test is discontinued the applicant is entitled to credit for only those entire pilot operations that he has successfully performed.

FLIGHT TEST PREREQUISITES

An applicant for the helicopter pilot flight test is required by revised § 61.39 of the Federal Aviation Regulations to have: (1) passed the appropriate helicopter pilot written test within 24 months before the date he takes the flight test, (2) the applicable instruction and aeronautical experience prescribed for the pilot certificate he seeks, (3) at least a second-class medical certificate issued within the past 12 months for a commercial pilot or at least a third-class medical certificate issued within the past 24 months for a private, (4) reached at least 17 years of age for a private or 18 years for a commercial, and (5) a written statement from an appropriately certificated and rated flight instructor certifying that he has given the applicant flight instruction in preparation for the flight test within 60 days preceding the date of application, and finds him competent to pass the test and to have a satisfactory knowledge of the subject areas in which he is shown to be deficient by his airman written test report.

HELICOPTER AND EQUIPMENT REQUIREMENTS FOR FLIGHT TEST

The applicant is required by revised § 61.45 to provide an airworthy helicopter for the flight test. This helicopter must be capable of, and its operating limitations must not prohibit, the performance of the pilot opera-

tions required in the test. The following equipment is relevant to the pilot operations required by revised § 61.107 for the private pilot flight test, and by revised § 61.127 for the commercial pilot flight test:

1. Two-way radio suitable for voice communications with aeronautical ground stations.

2. A radio receiver which can be utilized for available radio navigation facilities (may be the same radio used for communications).

3. Engine and flight controls that are easily reached and operated in a normal manner by both pilots.

4. Operating instructions and limitations. The applicant should have an appropriate checklist, an Owner's Manual/Handbook, or, if required by the helicopter used, an FAA approved Helicopter Flight Manual. Any operating limitations or other published recommendations of the manufacturer that are applicable to the specific helicopter will be observed.

PILOT OPERATIONS

Procedures/Maneuvers

I. PREFLIGHT OPERATIONS

Objective

To determine that the applicant can ensure that he meets pilot requirements, that the helicopter is airworthy and ready for safe flight, and that suitable weather conditions exist.

Procedures/Maneuvers

A. Certificates and Documents

1. Description The applicant may be asked to present his pilot and medical certificates and to locate and explain the helicopter's registration certificate, airworthiness certificate, operating manual or FAA approved Helicopter Flight Manual (if required), equipment list, and required weight and balance data. In addition, he may be asked to explain helicopter and engine logbooks or other maintenance records.

2. Acceptable Performance Guidelines The applicant shall be knowledgeable regarding the location, purpose, and significance of each required item.

B. Helicopter Performance and Limitations

1. Description The applicant may be orally quizzed on the performance capabilities, and approved operating procedures and limitations of the helicopter used. This includes power settings, placarded speeds, and fuel and oil requirements. In addition, the manufacturer's published recommendations or FAA approved Helicopter Flight Manual should be used to determine the effects of temperature, pressure altitude, wind, and gross weight on performance.

2. Acceptable Performance Guidelines The applicant shall obtain, explain, and apply the information which is essential in determining the performance and limitations of the helicopter used.

C. Weight and Balance

1. Description The applicant may be asked to demonstrate the application of the approved weight and balance data for the helicopter used to determine that the gross weight and center of gravity location are within limits. Charts and graphs provided by the manufacturer may be used.

2. Acceptable Performance Guidelines The applicant shall determine the empty weight, maximum gross weight, useful load (fuel, passengers, baggage) by reference to appropriate publications. He shall be evaluated on his ability to apply this information

to determine that the gross weight and center of gravity are within approved limits.

D. Weather Information

1. Description The applicant may be asked to obtain Aviation Weather Reports, Area and Terminal Forecasts, and Winds Aloft Forecasts pertinent to the proposed flight.

2. Acceptable Performance Guidelines The applicant shall demonstrate that he knows what weather information is pertinent and how to best obtain that information, and that he can interpret and understand its significance with respect to his proposed flight.

E. Line Inspection

1. Description The applicant may be asked to demonstrate a visual check to determine the helicopter's airworthiness and readiness for flight. This includes all required equipment and documents. A checklist provided by the manufacturer or operator should be used.

2. Acceptable Performance Guidelines The applicant shall use an orderly procedure in conducting a preflight check of the helicopter. He shall know the significance of each item checked and recognize any unsafe condition.

F. Helicopter Servicing

1. Description The applicant may be asked to demonstrate a visual inspection to

determine that the fuel is of the proper grade and type and the supply of fuel, oil, and other required fluids is adequate for the proposed flight. He should take appropriate action to eliminate possible fuel contamination in the helicopter.

2. Acceptable Performance Guidelines The applicant shall know the grade and type of oil and fuel specified for the helicopter and be able to determine the amount of fuel required to complete the flight. He shall know where to find all fuel and oil fillers, and the capacity of each tank, as well as the location of the battery. He shall also know the proper steps for avoiding fuel contamination during and following servicing.

G. Engine and Systems Preflight Check

1. Description The applicant may be asked to demonstrate a check to determine that the engine is operating within acceptable limits and that all systems, equipment, and controls are functioning properly and adjusted for takeoff. A checklist provided by the manufacturer or operator should be used.

2. Acceptable Performance Guidelines The applicant shall use proper procedures in engine starting and runup and in checking helicopter systems, equipment, and controls to determine that the helicopter is ready for flight. Careless operation in close proximity to obstructions, ground personnel, or other aircraft shall be disqualifying.

II. AIRPORT AND TRAFFIC PATTERN OPERATIONS

Objective

To determine that the applicant can safely and efficiently conform to arrival and departure procedures and established traffic patterns at controlled and noncontrolled airports, and can accomplish takeoffs and landings competently under various field and wind conditions.

Procedures/Maneuvers

A. Radio Communication and ATC Light Signals

1. Description The applicant may be asked to demonstrate the use of designated frequencies and recommended voice procedures to report position and state intentions regarding the flight and to obtain pertinent information and clearances. Where applicable, he is expected to use Airport Terminal Information Service, Airport Advisory Service, Control Tower, Approach and Departure Control, UNICOM, and ATC light signals.

2. Acceptable Performance Guidelines The applicant shall determine the type of communication facilities available, select correct frequencies, and use appropriate communications procedures to obtain and acknowledge necessary information. Failing to comply with airport traffic procedures or

instructions without permission to do so shall be disqualifying.

B. Airport and Heliport Markings and Lighting

1. Description Where available, the applicant may be asked to demonstrate the proper use of wind and traffic direction indicators, and markings indicating closed runways, taxiways, holding lines, and basic runways. He is also expected to be familiar with taxiway and runway lighting, rotating beacons, and obstruction lights.

2. Acceptable Performance Guidelines The applicant shall demonstrate a knowledge of standard wind and traffic direction indicators, markings and lighting, and how they relate to helicopter operation. Failure to properly use these aids, creating an unsafe situation, shall be disqualifying.

C. Airport and Heliport Operations

1. Description The applicant may be asked to demonstrate safe operating practices while in close proximity to other aircraft, persons, or obstructions.

2. Acceptable Performance Guidelines The applicant shall air taxi the helicopter in compliance with local taxi rules and control tower instructions. He shall avoid turbulence generated by large aircraft and exercise caution when operating near small aircraft or in the vicinity of people.

D. Traffic Patterns

1. Description The applicant may be asked to demonstrate arrival and departure procedures which avoid the flow of fixed-wing traffic or which comply with control tower instructions.

2. Acceptable Performance Guidelines The applicant shall apply proper corrections for drift, maintain adequate spacing, and adhere to prescribed altitudes and airspeeds.

E. Normal and Crosswind Takeoffs from a Hover

1. Description The applicant may be asked to demonstrate the transition from a stabilized hover to a climb in both normal and crossswind conditions.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his planning, smoothness, observance of traffic, and adherence to control tower instructions. Drift in excess of approximately one rotor diameter when below an altitude of 10 feet or of approximately 100 feet when above an altitude of 10 feet, or using incorrect pedal to compensate for torque changes shall be disqualifying.

F. Normal and Crosswind Approaches and Landings

1. Description The applicant may be asked to demonstrate normal and crosswind approaches and landings. The approaches

should be flown at the normal approach angle, terminating in a stabilized hover at a designated spot. Thereafter, the helicopter should be landed from a hover.

2. Acceptable Performance Guidelines The applicant shall establish and maintain the proper approach angle, airspeed, and ground track. Incorrect drift control or improper coordination shall be disqualifying.

G. Maximum Performance Takeoffs and Climbs

1. Description The applicant may be asked to demonstrate a maximum performance takeoff from the surface. Using the available maximum allowable takeoff power, he should transition into forward flight and attain a steep angle of climb to clear simulated obstructions in the flight path.

2. Acceptable Performance Guidelines Performance shall be evaluated on the basis of accurate coordinated control application to achieve a smooth transition from a position on the surface to a maximum performance climb. A smooth transition to a normal climb shall be accomplished after reaching a height of approximately 50 feet above the surface. Abrupt, uncoordinated control application, failure to achieve maximum performance, or failure to maintain RPM in the green arc shall be disqualifying.

NOTE: Penetration of the "height-velocity curve" during this maneuver is normal.

H. Steep Approaches

1. Description The applicant may be asked to demonstrate an approach flown at an angle steeper than for a normal approach and terminating in a stabilized hover at a designated spot. Thereafter, the helicopter should be landed from a hover.

2. Acceptable Performance Guidelines The applicant shall establish and maintain the proper steep approach angle, airspeed, and ground track. Excessive drift or faulty coordination of controls shall be disqualifying.

I. Collision Avoidance Precautions

1. Description The applicant is expected to exercise conscientious and continuous surveillance of the airspace in which the helicopter is being operated to guard against potential mid-air collisions. In addition to "see and avoid" practices, he is expected to use VFR Advisory Service at nonradar facilities, Airport Advisory Service at nontower airports or FSS locations, and Radar Traffic Information Service, where available.

2. Acceptable Performance Guidelines The applicant shall maintain continuous vigilance for other aircraft and take immediate actions necessary to avoid any situation which could result in a mid-air collision.

Extra precautions shall be taken, particularly in areas of congested traffic, to ensure that his view of other aircraft is not obstructed by his helicopter's structure. When traffic advisory service is used, the applicant shall understand terminology used by the radar controller in reporting positions of other aircraft. Failure to maintain proper surveillance shall be disqualifying.

J. Wake Turbulence Avoidance

1. Description The applicant may be asked to explain how, where, and when wingtip and rotor vortices are generated, their characteristics, and the associated hazards. He may also be asked to explain the recommended courses of action to avoid the effects of wake turbulence of other aircraft and to minimize the effects of his helicopter's rotor downwash when operating in close proximity to other aircraft on the surface.

2. Acceptable Performance Guidelines The applicant shall identify the conditions and locations in which wingtip or rotor vortices may be encountered and adjust his flight path so as to avoid these areas. Failure to follow recommended procedures for minimizing the likelihood of flying into vortices or to minimize the effects of his rotor downwash when operating close to small aircraft on the surface shall be disqualifying.

III. STRAIGHT-AND-LEVEL FLIGHT, CLIMBS, DESCENTS, AND TURNS

Objective

To determine that the applicant can competently maneuver the helicopter while dividing his attention using instrument and outside visual references.

Procedures/Maneuvers

A. Straight-and-Level Flight

1. Description The applicant may be asked to maintain selected altitudes, headings, and airspeeds using outside references and flight instruments. This may be demonstrated in conjunction with other maneuvers, i.e., traffic patterns.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his ability to maintain altitude, heading, and airspeed within the following tolerances:

Private		*Commercial*
±100 feet	Altitude	±50 feet
±10 mph	Airspeed	±5 mph
±10°	Heading	±5°

B. Climbs and Descents

1. Description The applicant may be asked to demonstrate climbs and descents. He should adjust power and attitude to gain or lose altitude while maintaining recommended airspeeds. During level-offs, power and attitude should be adjusted to return the helicopter to straight-and-level flight. This

may be demonstrated in conjunction with other maneuvers, i.e., traffic patterns.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his ability to perform climbs and descents while remaining within the following tolerances:

Private		*Commercial*
±100 feet	Level-off altitude	±50 feet
±10 mph	Airspeed	±5 mph
±10°	Heading	±5°

C. Turns

1. Description The applicant may be asked to demonstrate turns to the left and to the right. He should apply sufficient lateral cyclic to bank the helicopter as desired. He should maintain the desired bank and vary power and attitude, as necessary, to control the airspeed and altitude. During the roll-outs from turns, power and attitude should be adjusted to return to straight-and-level flight. This may be demonstrated in conjunction with other maneuvers, i.e., traffic patterns.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his ability to perform turns while remaining within the following tolerances:

Private		*Commercial*
±100 feet	Altitude	±50 feet
±10 mph	Airspeed	±5 mph
±10°	Bank	±5°
±10°	Heading on roll-out	±5°

IV. NORMAL AND CROSSWIND TAKEOFFS AND LANDINGS (Commercial)*

Objective

To determine that the applicant can competently execute takeoffs and landings in various wind conditions.

* This is a *required pilot operation* for the commercial applicant; however, the *maneuvers* listed apply to both the private and the commercial pilot applicant under *II. Airport and Traffic Pattern Operations.*

Procedures/Maneuvers

A. Normal and Crosswind Takeoffs from a Hover (see II, E, on page 15).

B. Normal and Crosswind Landings (see II, F, on page 15).

V. HOVERING, MANEUVERING BY GROUND REFERENCES, AND AIR TAXIING

Objective

To determine that the applicant can take off to a hover, perform hovering turns, and fly a precision pattern at hovering altitude; and that he can precisely air and ground taxi in compliance with local taxi rules or control tower instructions.

Procedures/Maneuvers

A. Vertical Takeoffs to a Hover

1. Description The applicant may be asked to demonstrate an ascent to a stabilized hover.

2. *Acceptable Performance Guidelines*
The applicant shall ascend smoothly to hovering altitude. He shall maintain a position within a designated area, a safe altitude, and the assigned heading within the following tolerance:

Private		*Commercial*
±10°	Heading	±5°

B. Landing from a Hover

1. Description The applicant may be asked to demonstrate a landing from a stabilized hover.

2. *Acceptable Performance Guidelines*
The applicant shall descend from hovering altitude and land at a designated spot with a minimum of forward and no backward or sideward movement. He shall maintain the assigned heading within the following tolerance:

Private		*Commercial*
±10°	Heading	±5°

C. Hovering Turns

1. Description The applicant may be asked to perform precision 90°, 180°, and 360° turns at hovering altitude.

2. *Acceptable Performance Guidelines*
The applicant shall make both right and left hovering turns. He shall maintain a position within a designated area, a safe altitude, and the desired headings within the following tolerance:

Private		*Commercial*
±10°	Headings	±5°

D. Pattern Flying at Hovering Altitude

1. Description The applicant may be asked to perform precision patterns at hovering altitude around a square, rectangle, or other ground reference. Demonstrations of forward, sideward, and rearward hovering flight should be included.

2. Acceptable Performance Guidelines The applicant shall fly the preselected pattern accurately, maintaining a safe altitude and the desired headings within the following tolerance:

Private		*Commercial*
±10°	Headings	±5°

E. Taxiing on the Surface

1. Description The applicant may be asked to move the helicopter on the surface under its own power, from one point to another, as directed.

2. Acceptable Performance Guidelines The applicant shall maintain positive control of the helicopter, safely clear obstructions, and accurately move from one designated spot to another while in contact with the surface. He shall maintain a speed appropriate to existing conditions (no greater than 5 MPH).

F. Air Taxiing

1. Description The applicant may be asked to maneuver the helicopter along a

designated route at hovering altitude, as directed.

2. *Acceptable Performance Guidelines* The applicant shall maintain positive control of the helicopter, safely clear obstructions, and move over the surface at hovering altitude, accurately following a designated route. He shall maintain a groundspeed appropriate to existing conditions (no greater than 10 MPH).

VI. RAPID DESCENT WITH POWER AND RECOVERY (Commercial)*

Objective

To determine that the applicant understands and can recognize conditions of flight which result in a rapid descent (settling-with-power), and that he can safely recover from those descents.

* This is a *required pilot operation* for the commercial pilot applicant; however, the *maneuver* "settling-with-power," applies to *both* the private and the commercial pilot applicant under *IX. Emergency Operations.*

Procedures/Maneuvers

A. Settling-With-Power

1. Description The applicant may be asked to explain the conditions of flight which result in "settling-with-power" and the effects of power on its severity. He may also be asked to demonstrate entry into this condition

with an *immediate* recovery initiated when the first indications are detected.

2. Acceptable Performance Guidelines The applicant shall display a thorough knowledge of settling-with-power. Failure to immediately recognize this condition and to initiate a prompt recovery shall be disqualifying.

VII. HIGH ALTITUDE TAKEOFFS, ROLL-ON LANDINGS, AND RAPID DECELERATIONS

Objective

To determine that the applicant has the control touch and coordination to safely take off and land under high altitude conditions and to safely perform quick stops.

Procedures/Maneuvers

A. High Altitude (Running) Takeoffs

1. Description The applicant may be asked to demonstrate a takeoff using less than hover power. A high altitude or high gross weight condition may be simulated by the examiner so that the helicopter cannot become airborne without benefit of forward speed to gain effective translational lift.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his proper coordination of controls to achieve a gradually accelerating straight ground run to a point where effective translational lift occurs, and thereafter, a

smooth transition to flight. Normal climb speed shall be attained before exceeding an altitude of 10 feet.

B. Shallow Approaches and Roll-On (Running) Landings

1. Description The applicant may be asked to make an approach and landing using less than hover power. The examiner may limit power to simulate a high altitude or high gross weight condition. Sufficient forward speed should be maintained to take advantage of translational lift until ground contact is made.

2. Acceptable Performance Guidelines The applicant shall establish and follow a shallow approach angle so that ground contact is made beyond and within 100 feet of a designated spot. Performance shall be evaluated on the basis of proper control coordination to maintain a constant approach angle and to touch down smoothly in level attitude while still in translational lift.

C. Rapid Decelerations (Quick Stops)

1. Description The applicant may be asked to execute a rapid deceleration. He should perform this maneuver into the wind from less than normal cruise speed, at an altitude which will provide tail rotor clearance throughout the maneuver and avoid penetration of the "height-velocity-curve." The helicopter should be decelerated until the de-

sired groundspeed is attained, then the maneuver terminated at a stabilized hover.

2. *Acceptable Performance Guidelines* Performance shall be evaluated on the basis of the applicant's proper coordination of all controls. He shall maintain a constant heading and terminate at a predetermined spot, within the following tolerance:

Private	*Commercial*
±50 feet	±25 feet

VIII. CROSS-COUNTRY FLIGHT OPERATIONS

Objective

To determine that the applicant can prepare for and conduct a safe, expeditious cross-country flight.

Procedures/Maneuvers

A. Flight Planning

1. Description The applicant may be asked to plan a cross-country flight to a point at least 2 hours away at the cruising speed of the helicopter used. At least one intermediate stop should be included. Planning should include the procurement of pertinent and available weather information; plotting the course on an aeronautical chart; selecting checkpoints; measuring distances; and computing flight time, headings, and fuel requirements. The Airman's Information Manual should be used as a reference for airport information, NOTAMS, and such other ap-

propriate guidance as may be extracted from its contents.

2. Acceptable Performance Guidelines Ali flight pla..ning operations shall be meaningful, accurate, and applicable to the trip proposed. The applicant shall explain his plan for the flight, verify his calculations, and present his sources of information and data.

B. Conduct of Planned Flight

1. Description The applicant may be asked to perform the planned flight using pilotage, dead reckoning, and VOR or ADF radio aids as appropriate to the equipment in the helicopter. He should make good the desired track, determine position by reference to landmarks, and calculate estimated times of arrival over checkpoints. He may also be asked to intercept and follow a VOR radial, or an NDB bearing using ADF, recognize station passage, and determine position by means of cross bearings. (The applicant will not be asked to perform these VOR and ADF procedures if he has shown competency in them on a previous FAA flight test.)

The applicant should set out on the cross-country flight which he had planned before takeoff. The planned course should be followed at least until the applicant establishes the compass heading necessary to stay on course, and can give a reasonable estimate of his groundspeed and time of arrival at his first point of intended landing.

2. *Acceptable Performance Guidelines*
The applicant shall: (1) establish and maintain headings required to stay on course; (2) correctly identify position; (3) provide reasonable estimates of times of arrival over checkpoints and destination with an apparent error of not more than 10 minutes; and (4) maintain altitude within ±200 feet of the planned altitude.

C. Diversion to an Alternate

1. Description When requested by the examiner to divert to an alternate airport, as might be necessary to avoid adverse weather, the applicant is expected to determine the new course. This may be accomplished by means of pilotage, dead reckoning, or radio navigation aids.

2. *Acceptable Performance Guidelines*
The applicant shall take prompt action to avoid the announced hazard and either proceed toward the alternate or land at a suitable area and plot the new course. He shall compute, within a reasonable time, a new heading and estimate the flying time and required fuel to reach the alternate.

IX. EMERGENCY OPERATIONS

Objective

To determine that the applicant can react promptly and correctly to emergencies which may occur during flight.

Procedures/Maneuvers

A. Autorotative Descents

1. Description During cruising flight at traffic pattern altitude or higher, the examiner may close the throttle to simulate power failure. In response to the simulated emergency, the applicant should perform an autorotative descent to a designated landing area. An autorotative turn up to 180° may be necessary.

2. Acceptable Performance Guidelines Performance shall be evaluated on the basis of the applicant's action to safely complete an autorotative descent to a designated area suitable for touchdown. Slow reaction to the simulated emergency, such as failure to lower collective pitch immediately, allowing rotor RPM to exceed limits, or faulty planning of the pattern shall be disqualifying. The applicant shall complete the maneuver in a power recovery to a hover within ±100 feet of a predetermined spot.

NOTE: No simulated power failure will be given where an actual touchdown could not be safely completed if one should become necessary, nor where an autorotative descent might constitute a violation of Federal Aviation Regulations. At the examiner's discretion, the applicant may be permitted to make an autorotative touchdown; however, landings without power are *not* required.

B. Power Failure at a Hover

1. Description During either a stabilized hover or forward air taxiing, the examiner may close the throttle to simulate power failure. In response to the simulated emergency, the applicant should perform a hovering autorotation.

2. Acceptable Performance Guidelines Performance shall be evaluated on the basis of the applicant's proficiency in accomplishing a safe touchdown. Poor directional control, excessive drift, or subjecting the landing gear to excessive side loads during the landing shall be disqualifying.

C. Settling-With-Power (see paragraph VI.A., page 24).

D. Partial Power Failure

1. Description In either hovering or cruising flight, the examiner may limit the power output to a level which will no longer support continued flight. The applicant is expected to immediately recognize the loss of power and take prompt corrective action.

2. Acceptable Performance Guidelines If in a hover, the applicant shall land the helicopter in a level attitude. If in cruising flight, he shall begin an approach to the nearest suitable landing area using the power available. The applicant's performance shall be evaluated on the basis of the safety and effectiveness of his operations and the thor-

oughness of his cockpit check to identify the cause of power loss.

E. Systems or Equipment Malfunctions

1. Description The applicant may be asked to demonstrate a knowledge of corrective actions for such malfunctions as: inoperative electrical system (generator, alternator, battery, or circuit breaker); electrical fire or smoke in cockpit; inoperative hydraulic system; or inoperative trim. He should, where practical, actually demonstrate the proper remedial action for such emergency conditions.

2. Acceptable Performance Guidelines Performance shall be evaluated on the applicant's prompt analysis of the situation and his remedial course of action. The applicant shall apply normal remedies before taking drastic emergency action. Any action which creates unnecessary additional hazards shall be disqualifying.

F. Lost Procedures

1. Description The applicant may be asked to explain the proper courses of action to be taken in the event he becomes lost, loses radio communications, or encounters unanticipated adverse weather.

2. Acceptable Performance Guidelines Performance shall be evaluated on the applicant's ability to promptly analyze the situation and describe the appropriate remedial action.

G. Slope Takeoffs (Commercial)

1. Description The applicant may be asked to demonstrate a takeoff from a cross-slope to a stabilized hover.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of positive accurate control technique to achieve a smooth transition from a position on a cross-sloping surface to a stabilized hover. Poor heading control, poor RPM control (overspeed or underspeed above or below the green arc), sliding downslope, or turning the tail of the helicopter upslope shall be disqualifying.

H. Slope Landings (Commercial)

1. Description The applicant may be asked to demonstrate a landing on a cross-slope from a stabilized hover.

2. Acceptable Performance Guidelines The applicant shall make an accurate descent from a stabilized hover to a landing on cross-sloping terrain. The applicant shall recognize when the slope is too steep and abandon the attempt to land at the first indication of mast-bumping or before full lateral cyclic has been applied. In this case, he shall move the helicopter to a more acceptable slope. Failure to maintain heading within ±5°, poor RPM control (overspeed or underspeed above or below the green arc), sliding downslope, or attempting to land on too steep a slope after

mast-bumping occurs or full lateral cyclic has been applied shall be disqualifying.

I. Confined Area Takeoffs and Climbs (Commercial)

1. Description The applicant may be asked to demonstrate a takeoff from the ground, and a climb, from an area where the climb angle and flight path are determined by wind, obstructions, and terrain features. He should perform a ground reconnaissance prior to takeoff.

2. Acceptable Performance Guidelines The takeoff and climb shall be as near normal as possible and shall be performed to take advantage of wind, lowest barrier, and best terrain. Poor planning and judgment, incorrect use of power or controls, or poor RPM control (overspeed or underspeed above or below the green arc) shall be disqualifying.

J. Confined Area Approaches and Landings (Commercial)

1. Description The applicant may be asked to demonstrate an approach to, and landing in, an area where the flight path and approach angle are determined by wind, terrain features, and obstructions. He should perform both a high and low reconnaissance.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of planning, judgment, and control coordination. Unnecessary flight over

unfavorable areas, attempting to fly an approach angle which will not safely clear obstructions, poor RPM control (overspeed or underspeed above or below the green arc), or inaccuracy in landing at the selected touchdown point shall be disqualifying.

K. Pinnacle Takeoffs and Climbs (Commercial)

1. Description The applicant may be asked to demonstrate a takeoff and climb from a small area that is higher than the surrounding terrain. If no barrier exists, he should takeoff from a hover and make an airspeed-over-altitude departure. If a barrier is in the takeoff path, he should takeoff from the ground, and after clearing the barrier, make an airspeed-over-altitude departure. The climb angle and flight path are determined by wind, obstructions, and terrain features. Prior to takeoff, the applicant should perform a ground reconnaissance.

2. Acceptable Performance Guidelines The takeoff and climb shall be performed taking into consideration wind, lowest barrier, and terrain. Poor planning, poor judgment, incorrect use of power or controls, or poor RPM control (overspeed or underspeed above or below the green arc), shall be disqualifying.

L. Pinnacle Approaches and Landings (Commercial)

1. Description The applicant may be asked to demonstrate an approach to, and landing on, a small area that is higher than the surrounding terrain. The flight path and approach angle are determined by wind, obstructions, and terrain features. The applicant should perform both a high and low reconnaissance.

2. Acceptable Performance Guidelines The applicant shall fly a pattern suitable to the conditions of wind and terrain. Performance shall be evaluated on the basis of planning, judgment, and control coordination. Attempting to fly an approach angle which is inappropriate for existing conditions, poor RPM control (overspeed or underspeed above or below the green arc), or failure to land at the selected touchdown point shall be disqualifying.